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Descriptions of new species of the genus *Elegia* from Turkey (Lepidoptera, Pyraloidea)

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Abstract: Descriptions of new species of the genus *Elegia* from Turkey (Lepidoptera, Pyraloidea). *Misc. Pap*. 206: 1-8, 16 figs. 2 tab.
This paper deals with the species of *Elegia*, inhabiting in Turkey. Two new species *Elegia feminina* **sp.n.** and *Elegia saecula* **sp.n.** are described. *Elegia fallax* Staudinger is recorded from different provinces of East Turkey. Male genitalia of three species are illustrated. Identity of *Elegia iozona* Meyrick is discussed. Totally 5 *Elegia* species in Turkey are listed.

Key words: *Elegia*, Phycitinae, Pyraloidea, Turkey, new species, mt DNA

In this paper, three *Elegia* species are evaluated and discussed from the morphological and molecular standpoints. As a result of these, two new species are described here.

Elegia Ragonot,1887

Elegia Ragonot,1887, *Annls Soc. Ent. Fr.* (6) 7: 229. Type-species: *Elegia atrifasciella* Ragonot,1887, by monotypy.

This genus was established by Ragonot and currently placed in the tribe Phycitini.

Externally, it is easy to identify the specimens as *Elegia*, but the specimens from Turkey are very similar. For that reason they considered as a single species, namely *Elegia fallax* Stgr in the past (Roesler,1988). Slamka (2019) reported three species of *Elegia* in Turkey. He illustrated the male genitalia of *fallax* Stgr and *iozona* Meyrick and distinguished them particularly by the shape of gnathos. Among the hitherto known *Elegia* species in Turkey, the spoon-shaped gnathos was characteristic for the species *iozona* only (Slamka,2019). During the expeditions of the authors in Turkey in the near past, two different *Elegia* species, carrying spoon-shaped gnathos in their males, were discovered. *Elegia iozona* was described by Meyrick in 1937 from northern Iraq (Diana). The type was preserved in the British Museum, London. Slamka illustrated the male genitalia of *diana's* type from British Museum. Unfortunately, this genitalic preparate was not good enough. However, it is clear that our two species are different from *iozona*. After the morphological and molecular studies of the present authors on the *Elegia* materials of Turkey, it became clear that

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the two *Elegia* species mentioned below are new to the science, and *Elegia fallax* Stgr is also distributed in East Turkey.

External morphology of the *Elegia* species of Turkey: Small sized moths. General colouration greyish. Sexually dimorph. Male of antenna carries more or less developed signum at base. Labial and maxillar palpi, proboscis developed. Fore-wing elongated, dark coloured. Costa slightly convex. Dark basal band on fore-wing upperside well developed. Its shape differs slightly in species. Hind-wing greyish, semi-transparent, veins distinct. Ciliae not chequered but bi-coloured.

Elegia fallax is bivoltine, flying in spring and late summer. Its adults nocturnal in the openings of *Quercus* woodlands.

Descriptions

Elegia feminina sp. n. (Figs. 1-2, 5-8, Tab. 1,2)

http://zoobank.org/NomenclaturalActs/204FAB73-8B1E-427F-8B27-13853A429BE6
Holotype (male)
Wing colourations and markings are in typical form of the genus *Elegia*. Dark basal band of fore-wing upperside well developed. Its distal side sinuous, more or less bordered light greyish, proximal side indistinct. Double blackish discal spots hardly visible. Post discal dark spots and stria poorly developed, irregular. Subapical area darker. Hind-wing greyish. Ciliae bi-coloured.
Male genitalia (GP3208): Uncus triangular, short, expanded basally. Gnathos terminally spoon-shaped, orbicular. Rate of uncus base/orbicular gnathos: 1.36. Labides short triangular terminally and pointed laterally. Its spines ordered regularly. Valva elongated terminally curved. Costa broadly chitinized, slightly concave. Median process well developed and chitinized. Aedeagus short and broad. Dental plate developed unilaterally serrate. Tapering median process of culcita well developed. Terminal head slightly developed, without central tooth.
Female genitalia: Unknown.
Diagnostic features are given comparatively in Table 1.
Material studied: 1♂ (Holotype), 1♂ (Paratype): South Turkey: İçel Prov., Anamur, Alaköprü 105m (33Ak), 31.iii.2017, M.Kemal & Koçak leg. (Coll. Cesa).
Etymology: The name *feminina* [2] for the new species is given to the equal rights to the women in Turkey as a part of the Atatürk's Reforms. [3] On February 6, 1935, the women of Turkey were allowed to vote in national elections for the first time. Women were even allowed to stand for office — and eighteen female candidates were elected to Turkey's parliament. The radical reform was part of Mustafa Kemal Atatürk's effort to secularize and modernize Turkish society. [4]
"Everything we see in the world is the creative work of women" Mustafa Kemal Atatürk.
Remarks: By using the external features, the specimens of this new species were previously identified by the authors as "*Elegia fallax*" incorrectly (Kemal & Koçak, 2018).

Elegia saecula sp. n. (Figs. 3-4, 9-13, Tab. 1,2)

http://zoobank.org/NomenclaturalActs/FD8B9753-D609-4949-B72D-1DE719880973
Holotype (male)
Wing colourations and markings are in typical form of the genus *Elegia*. Dark basal band of fore-wing upperside well developed. Its distal side somewhat irregularly convex, slightly bordered light greyish, proximal side indistinct. Double blackish discal spots hardly visible. Post discal dark spots and stria poorly developed, irregular. Subapical area darker. Hind-wing greyish, veins visible. Ciliae bi-coloured.
Male genitalia (GP3212): Uncus triangular, short, expanded basally. Gnathos terminally spoon-shaped, ovoid and angular at tip. Rate of uncus base/width of ovoid gnathos: 2.4. Labides short oval terminally. Its spines ordered regularly inwards at base, irregular terminally. Valva elongated terminally curved. Costa chitinized, convex. Median process weak. Aedeagus oblong. Dental plate

[2] This was previously used as a scientific name of various taxa of the Lepidoptera in different regions: *feminina* Sharpe,1904 (Lycaenidae); *feminina* Strand,1919 (Noctuidae); *feminina* Hulstaert,1924 (Lycaenidae); *feminina* Rothschild,1933 (Arctiidae).
[3] https://en.wikipedia.org/wiki/Atat%C3%BCrk%27s_Reforms#Women's_rights
[4] For further reading: http://web.archive.org/web/20160304053135/http://blog.oup.com/2012/02/turkey-women-vote/

developed, bi-laterally serrate. Tapering median process of culcita well developed. Terminal head distinct, with a central tooth.
Diagnostic features are given comparatively in Table 1.
Material studied: 1♂ (Holotype), 18♂♀ (Paratypes). South-East Turkey: Mardin Prov., Artuklu, Sultanköy 1.7km E 1070m (47Dc), 10 paratypes and holotype on 14.v.2017, and 8 paratypes on 15.v.2017, M. Kemal & A.Koçak leg. (Coll. Cesa).
Etymology: The name *saecula* [5] of this new species means forever.
"One day my mortal body will turn to dust but the Turkish Republic will stand forever"
Mustafa Kemal Atatürk (1926).
Remarks: Slamka stated(2019: 27): "In *iozona* the ante-medial band is "O" in shape (fig.9a) in *fallax* and in *atrifasciella* the edges of band are parallel... Generally the male genitalia are different, especially the gnathos which is spoon shaped, while in *fallax* and *atrifasciella* it is long and hooked".
The species *iozona* was described in a new genus by Meyrick in 1937 as "*Ichorarchis iozona*" from Diana 2800 ft (Iraq), collected by E.P.Wiltshire in June. Roesler incorrectly synonymized *iozona* in 1988 under the species *fallax*. Slamka (2019) proposed *iozona* as a bona species and followed the synonymy of *elegiella* Amsel with *iozona* previously proposed by Roesler (1988). The typical *iozona* occurs in Iraq (Diana). It was based upon a single male and its genitalia (unfortunately it is not possible to see the necessary details) was illustrated by Slamka (2019: 173, pl.4 fig.9). On the other hand, Slamka (2019: 273, pl.104 figs. 9a-b) illustrated two female genitalia of *iozona* (sensu Slamka) from Iran and Maden (Elazığ Prov., East Turkey). The morphological identification of *iozona* outside from its type locality in Iraq seems unclear and subjective. The type material of *iozona* is too old for a reliable mitochondrial analysis; therefore a genetic distance to the related populations cannot be calculated reliably. Under these circumstances, we are of the opinion that *iozona* should be leaved alone until further material and new information about its validity appear.
As to the status of the new species, the genetic distance between *Elegia saecula* and its nearest species *Elegia feminina* from Anamur is high enough, namely 3.59%. Between *Elegia saecula* and *Elegia iozona* several important morphological differences are seen on the male genitalia and culcita. However, the only reliable solution between *iozona* and *saecula* is based on the calculation the genetic distance. Currently, such a process is impossible. A molecular solution may be found in future. Until then, all morphological approach seems subjective or prejudicial, due to the unclearness of *iozona* expressed above.

Elegia fallax Staudinger,1881 (Figs. 14-16, Tab. 1,2)

Brief description: Wing colourations and markings are in typical form of the genus *Elegia*. Dark basal band of fore-wing upperside well developed. Its distal side somewhat irregularly straight, proximal side indistinct. Double blackish discal spots hardly visible. Post discal dark spots and stria poorly developed, irregular. Subapical area darker. Hind-wing greyish, veins visible.
Male genitalia (GP3213, GP3216): Uncus and gnathos very long. Labides long. Its spines ordered regularly outwards. Costa of valva almost straight. Median process reduced but chitinized. Aedeagus short, broad. Dental plate developed, irregular shaped, spines variable. Median process of culcita well developed, broad at base, terminal head indistinct.
Phenology of the adults: Bivoltine in spring and late summer.
Material studied: 1♂ (GP3213). South-East Turkey: Şırnak Prov., Beytüşşebap, Dule valley, Öküzmağarası 1250m (73Ad2), 15.viii.2013, M.Kemal & A.Koçak leg. - 1♀. From same place, on 17.viii.2017 (coll. Cesa). 1♂ (GP3216): East Turkey: Bitlis Prov., Mutki, Aydemir 1710m (13F71), 25.vii.2017. 1♀. From same place and date, M.Kemal & A.Koçak leg. (coll. Cesa).
Following specimens need further investigation: 1♀. South-East Turkey: Şırnak Prov., Cudi Mountain, Cevizdüzü 890m (73Df), 24.v.2011, M.Kemal & A.Koçak leg. - 1♂. South-East Turkey: Siirt Prov., Şirvan, Nergisli 630m (56Fv), 18.iv.2015, M.Kemal & A.Koçak leg. (coll. Cesa).
Remarks: Adult of *Elegia fallax* was illustrated by the authors in nature from Bitlis Prov., Mutki, Aydemir as fig.33 (Kemal & Koçak, 2017). This species is reported here from Şırnak and Siirt Provinces for the first time.

[5] Similar names were previously used for different taxa as *secularis* Meyrick, 1918 (Eriocottidae) and *secula* Holloway,1999 (Lymantriidae).

Table 1 – Diagnostic features of three *Elegia* species in Turkey

Structures	***Elegia feminina* sp.n.**	***Elegia saecula* sp.n.**	***Elegia fallax*** Stgr
uncus shape	triangular, short	triangular, short	elongate
Gnathos	Spoon-shaped terminally. Orbicular	Spoon-shaped terminally. Ovoid, angular at tip.	Slender, somewhat pointed terminally
Rate of uncus base/ width of gnathos	1.36	2.4	-
Labides	Short triangular	ovoid	Very elongated triangular
spines of labides	regularly outwards	ordered basally inwards, irregular terminally	regularly outwards
costa of valva	Slightly concave	convex	almost straight
median process of valva	well developed and chitinized	weak	weak but chitinized
median process of culcita	tapering, without central tooth	tapering, with a central tooth	broad at base, narrower terminally, without a distinct head.

DNA barcoding and species delimitations of the selected *Elegia* populations

Within the frame of the private barcoding Project of the Lepidoptera of Turkey, in this study, mt COI DNA barcodes were used to test the correctness of morphologically defined the new species.
DNA sequences for the barcode region of mitochondrial cytochrome oxidase I (mtCOI) were obtained for two *Elegia* populations (Anamur and Mardin) and *Elegia fallax* populations (Bitlis and Şırnak) (Table 2).
The genetic distance between *saecula* (Mardin) and *feminina* (Anamur) is 3.59%. The distance between *saecula* and the *fallax* (Bitlis) is 3.61%. Similarly, the genetic distance between the *feminina* and the *fallax* (Bitlis) is 2.39%. Mardin and Anamur populations are identified here as two separate species at the molecular level and support the results of two new species based on their morphology. The genetic distance between two *fallax* populations from Bitlis and Şırnak is less than 2% (Kimura, 1980; Tamura *et al.,* 2013).

Table 2- Data for sequenced *Elegia* species of Turkey

Name of the taxa	**Type & sex**	**Collecting information**	**DNA voucher**	**Collection**
Elegia feminina sp.n.	Holotype, male	Turkey – İçel Province, Anamur, Alaköprü 105m, 31 iii 2017, M.Kemal & A.Koçak leg. (Cesa)	LepDNA Pyr079, 658 bp.	Cesa
Elegia saecula sp.n.	Holotype, male	Turkey – Mardin Province, Artuklu, Sultanköy 1070m, 14 v 2017, M.Kemal & A.Koçak leg. (Cesa)	LepDNA Pyr077, 658 bp.	Cesa
Elegia fallax Stgr.	female	Turkey – Bitlis Province, Mutki, Aydemir 1710m, 25 vii 2017, M.Kemal & A.Koçak leg. (Cesa)	LepDNA Pyr078, 658 bp.	Cesa
Elegia fallax Stgr.	female	Turkey – Şırnak Province, Beytüşşebap, Dule, Öküz mağarası 1250m 17.viii. 2013 M.Kemal & A.Koçak leg. (Cesa)	LepDNA Pyr108, 658 bp.	Cesa

List of the *Elegia* species occuring in Turkey

1) *Elegia fallax* (Staudinger,1881)
2) *Elegia atrifasciella* Ragonot,1887
3) *Elegia iozona* (Meyrick,1937) (Slamka,2019). It needs further studies.
4) *Elegia feminina* **sp.n.**
5) *Elegia saecula* **sp.n.**

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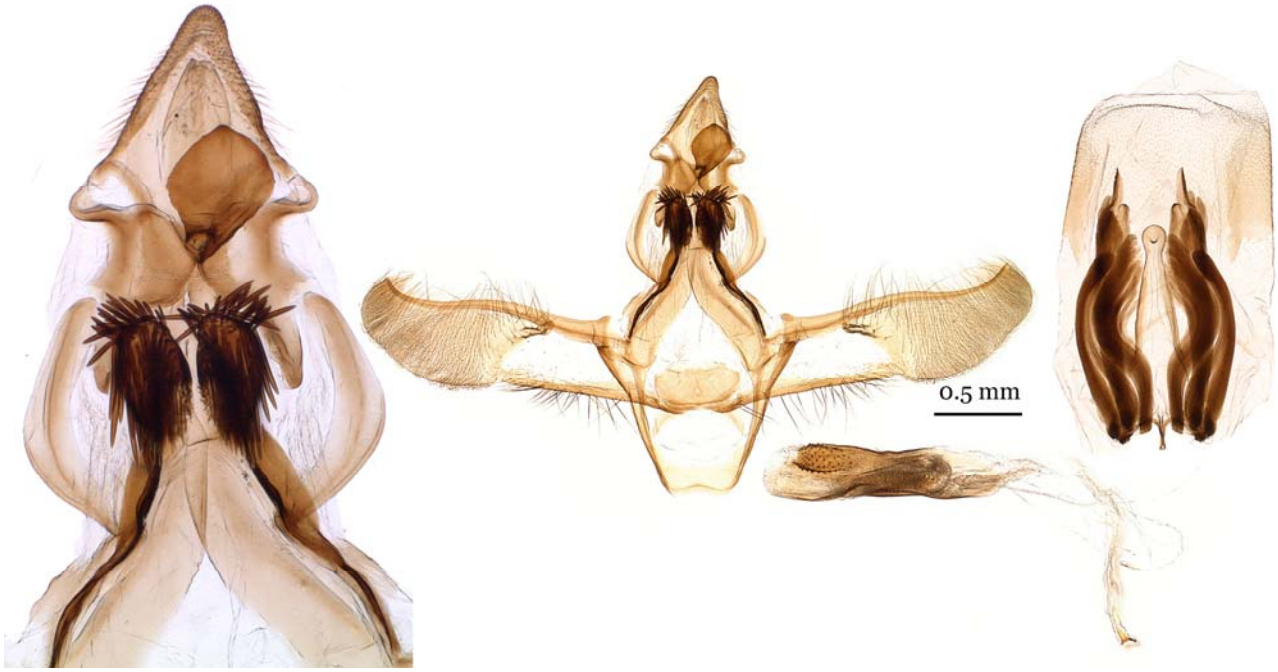
Figures

Figs. 1-4. Head of *Elegia* (lateral and dorsal view): *Elegia feminina* **sp.n**. (left pair). *Elegia saecula* **sp.n**. (right pair). M.Kemal (Cesa)

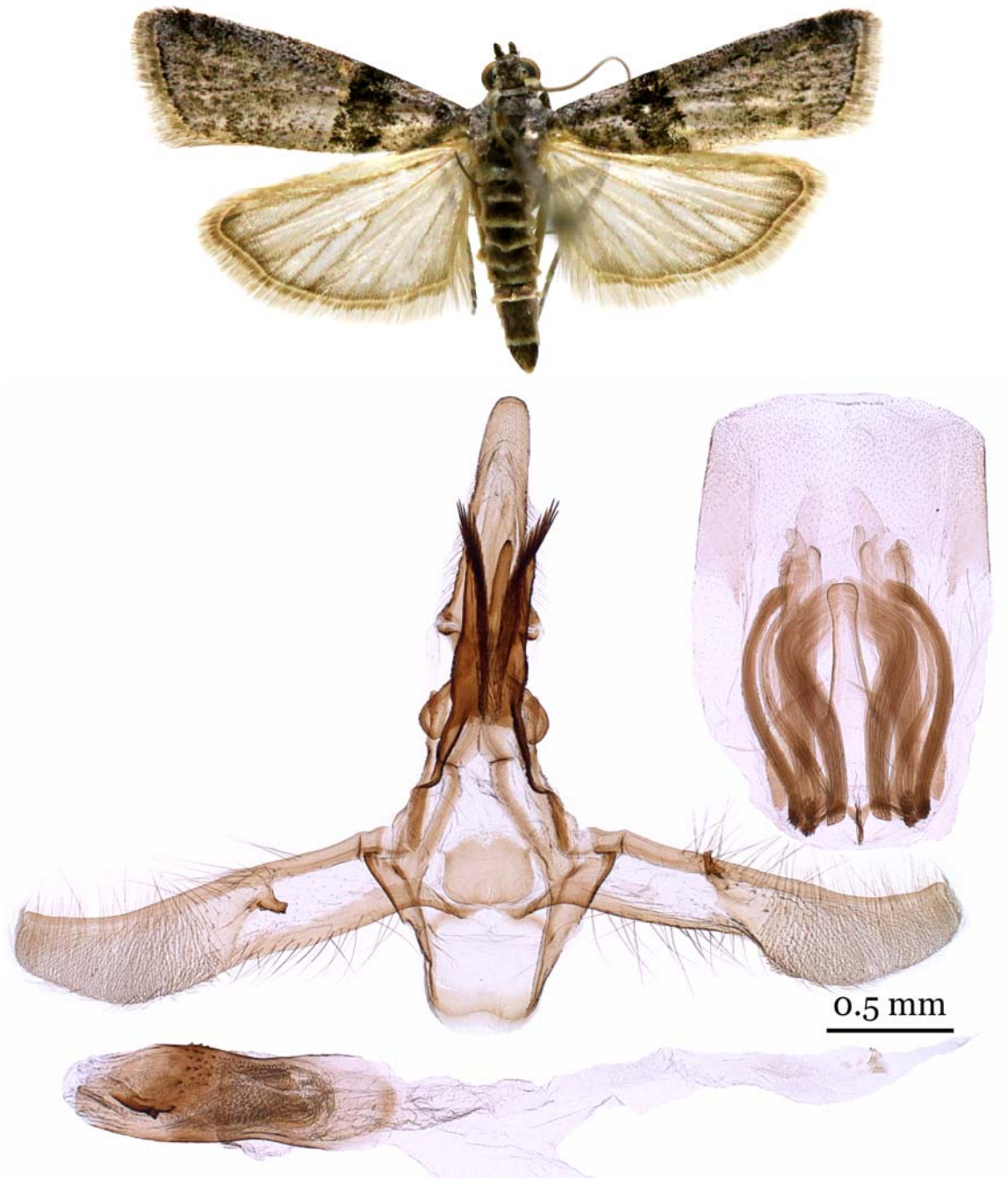
Fig. 5 – *Elegia feminina* **sp.n.** Upperside of the holotype (male). South Turkey, İçel Province, Anamur. M.Kemal (Cesa)

Figs. 6-8 – *Elegia feminina* **sp.n.** Male genitalia of the holotype (GP3208). Enlarged uncus, gnathos and labides. (left). Total view of the genitalia removed aedeagus and culcita (right). South Turkey, İçel Province, Anamur. M.Kemal (Cesa)

Figs. 9, 10 – *Elegia saecula* **sp.n.** Upperside of the holotype (male). Dorsal (left) and lateral (right) views of the signum or "knot" at the base of the left antenna, surrounded by scales.



Figs. 11-13 – *Elegia saecula* **sp.n.** Male genitalia of the holotype (GP3212). Enlarged uncus, gnathos and labides (left). Total view of the genitalia removed aedeagus and culcita (right). South-East Turkey, Mardin, Artuklu. M.Kemal (Cesa).



Figs. 14-16- *Elegia fallax* Stgr. Upperside of the male, its genitalia with removed aedeagus and culcita (GP3213). South-East Turkey, Şırnak Province, Beytüşşebap, Dule valley. M. Kemal (Cesa).

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